HARVEY82
Harvey, Brian; Why Logo?; Byte 7, 8 (August 1982).

Summary of Ideas

Logo is a language meant to "encourage development of problem-solving skills". It is a tool to look at "the computer as an object for intellectual exploration".

Logo is not meant to replace other languages in that it is not meant to train computer programmers, but rather to encourage learning that can be applied in all areas.

BASIC was a pioneer in interactive programming but is limited in power, whereas Pascal is too oriented to production programming and is thus less useful for learning.

There has been a lack of problems for beginning programmers that are both interesting and easy enough. Logo introduced turtle geometry, which is an easier approach to graphics than the traditional Cartesian coordinate system and is thus more accessible to beginners.

Logo is not meant simply as a child's language, and in fact has been used successfully as a language to teach physics to university undergraduates.

Important Points

Logo is compared to several other languages as a learning language (BASIC, Pascal, C, FORTRAN, LISP and APL). The article notes that BASIC, unlike Logo, does not have a true procedural construct; that Logo is interactive which speeds development of a program (which it notes is the major task in learning), and that Logo's syntax encourages recursion.

Logo's data structures are based on those in LISP, with the main grouping mechanism being the list. Logo also provides the natural hierarchy of letters, words and sentences as standard objects.

All variables in Logo are untyped and can hold values of any kind. The author argues that the present belief that variable type declaration is a good thing, is based on the historical fact that it is easier for a compiler to produce code if it knows the types of the variables, and that typing is an unnecessary constraint.

Logo is extensible in the fact that user procedures look and act like primitive procedures and that there are few built in control constructs, since custom constructs can be added by the user. In the case of some arithmetic operations the designers bowed to practice and provide an infix form as well as the standard Logo procedure prefix form.

Logo is user-friendly in the sense that it provides helpful error messages, is interactive and makes certain constructs like x<-x+1 explicit in that it distinguishes between the variable's value and its name (MAKE "X :X+1).

Relevance

This article explains why Logo is considered as a possible replacement for BASIC as a learning language (or a first language) and explains the philosophy of Logo as compared to LISP, APL, Pascal etc. It also explains why Logo should not only be considered as a children's language but rather as a new kind of language designed for learning.